

BIOINFORMATICS, BACHELOR OF SCIENCE (COLLEGE OF ARTS AND SCIENCES)

To obtain a BS in Bioinformatics, a student must fulfill university, college, and departmental requirements. Bioinformatics is an interdisciplinary major and, as such, satisfies the college requirement for breadth. Other hour requirements follow:

- 46 hours of University General Education courses –Most commonly, Bioinformatics majors do not complete 46 hours of coursework solely for the purpose of meeting University General Education requirements. Instead, they often do the following:
 - Test out of at least three hours of fundamental academic skills,
 - Take courses that meet both the six hours of diversity requirements and six hours of distribution requirements,
 - Meet the seven-hour natural sciences distribution requirement through completing major courses.
- In such cases, the number of credit hours taken solely to meet General Education requirements is reduced to 30 or fewer.
- 77-79 hours of major courses
- 0-13 hours of electives

TOTAL HOURS: 120

Double Majors

For a double major in Bioinformatics and Biology or Bioinformatics and Molecular and Biomedical Biology, beyond BIOL 1450, BIOL 1750, BIOL 2140, and BIOL 3020, no other biology courses may count for both majors.

Major and Minors

For a Bioinformatics major and a Biology or Molecular and Biomedical Biology minor, beyond BIOL 1450, BIOL 1750, BIOL 2140, and BIOL 3020, no other biology courses may count for both major and minor.

Requirements

The Bachelor of Science in bioinformatics degree requires a minimum of 120 credit hours for its completion. Required courses are below.

The required courses are:

Code	Title	Credits
Bioinformatics		
BIOI 1000	INTRODUCTION TO BIOINFORMATICS	3
BIOI 2000	FOUNDATIONS OF BIOINFORMATICS	3
BIOI 3000	APPLIED BIOINFORMATICS	3
BIOI 3500	ADVANCED BIOINFORMATICS PROGRAMMING	3
BIOI 4860	BIOINFORMATICS ALGORITHMS	3
BIOI 4870	DATABASE SEARCH AND PATTERN DISCOVERY IN BIOINFORMATICS	3
Biology		
BIOL 1450	BIOLOGY I	5
BIOL 1750	BIOLOGY II	5
BIOL 2140	GENETICS	4
BIOL 3020	MOLECULAR BIOLOGY OF THE CELL	3
BIOL 4130	MOLECULAR GENETICS	4

or BIOL 4140	CELLULAR BIOLOGY	
BIOL 4560	BIOINFORMATICS INTERNSHIP	1-3
Chemistry¹		
CHEM 1140 & CHEM 1144	FUNDAMENTALS OF COLLEGE CHEMISTRY and FUNDAMENTALS OF COLLEGE CHEMISTRY LABORATORY	5
CHEM 2210 & CHEM 2214	FUNDAMENTALS OF ORGANIC CHEMISTRY and FUNDAMENTALS OF ORGANIC CHEMISTRY LABORATORY	5
CHEM 3650 & CHEM 3654	FUNDAMENTALS OF BIOCHEMISTRY and FUNDAMENTALS OF BIOCHEMISTRY LABORATORY	4
Computer Science		
CIST 1400	INTRODUCTION TO COMPUTER SCIENCE I	3
CSCI 1620	INTRODUCTION TO COMPUTER SCIENCE II	3
CIST 2500	INTRODUCTION TO APPLIED STATISTICS FOR IS&T	3
CIST 3110	INFORMATION TECHNOLOGY ETHICS	3
CSCI 3320	DATA STRUCTURES	3
Mathematics		
MATH 1950	CALCULUS I	5
MATH 2030 or CSCI 2030	DISCRETE MATHEMATICS or MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE	3

Total Credits **77-79**

¹ Students may substitute the pre-medicine sequence of Chemistry for the fundamentals track of Chemistry outlined in this major.

Freshman

Fall		Credits
ENGL 1150	ENGLISH COMPOSITION I (*)	3
BIOI 1000	INTRODUCTION TO BIOINFORMATICS	3
CIST 1300 or CSCI 1200	INTRODUCTION TO WEB DEVELOPMENT (**)	3
	or COMPUTER SCIENCE PRINCIPLES	
MATH 1950	CALCULUS I (***)	5

*ENGL 1150: Requires appropriate English placement.

**CIST 1300 and CSCI 1200: either one requires MATH 1120 or MATH 1130 or MATH 1220 or MATH 1300 (or equivalent) with C- or better.

***MATH 1950: Requires appropriate placement.

	Credits	14
Spring		
ENGL 1160	ENGLISH COMPOSITION II (*)	3
CMST 1110 or CMST 2120	PUBLIC SPEAKING FUNDS or ARGUMENTATION AND DEBATE	3
MATH 2030	DISCRETE MATHEMATICS (**)	3
CIST 1400	INTRODUCTION TO COMPUTER SCIENCE I (***)	3
BIOI 2000	FOUNDATIONS OF BIOINFORMATICS (#)	3
	*ENGL 1160: Requires ENGL 1150 or appropriate English placement	
	**MATH 2030: Requires MATH 1950.	
	***CIST 1400: Requires MATH 1320 or higher and CIST 1300, CSCI 1200, or CSCI 1280.	

#BIOI 2000: Requires BIOI 1000 or BIOL 1450.

		Credits	15
Sophomore			
Fall			
BIOL 1450	BIOLOGY I (*)		5
Humanities/Fine Arts + Global Diversity			3
BIOI 3000	APPLIED BIOINFORMATICS (**)		3
CSCI 1620	INTRODUCTION TO COMPUTER SCIENCE II (***)		3
*BIOL 1450: Requires high school biology.			
**BIOI 3000: Requires BIOI 2000 and CIST 1400.			
***CSCI 1620: Requires CIST 1400 with grade of C or better and MATH 1930 or MATH 1950 with grade of C- or better..			
		Credits	14
Spring			
CHEM 1140 & CHEM 1144	FUNDAMENTALS OF COLLEGE CHEMISTRY and FUNDAMENTALS OF COLLEGE CHEMISTRY LABORATORY (**)		5
BIOL 1750	BIOLOGY II (*)		5
BIOI 3500	ADVANCED BIOINFORMATICS PROGRAMMING (***)		3
CSCI 3320	DATA STRUCTURES (#)		3
*CHEM 1140: Requires MATH 1220 or MATH 1300 or higher or appropriate ACT/SAT/Math Placement Exam. Must take CHEM 1144 concurrently.			
**BIOL 1750: Requires BIOL 1450.			
***BIOI 3500: Requires BIOI 3000 and CSCI 1620. CSCI 3320 is strongly recommended but not required.			
#CSCI 3320: Requires CSCI 1620 with a grade of C or better and CSCI 2030, MATH 2030, or MATH 2230 with a grade of C- or better.			
		Credits	16
Junior			
Fall			
CHEM 2210 & CHEM 2214	FUNDAMENTALS OF ORGANIC CHEMISTRY and FUNDAMENTALS OF ORGANIC CHEMISTRY LABORATORY (*)		5
BIOL 2140	GENETICS (**)		4
Social Science Course + US Diversity			3
BIOI 4860	BIOINFORMATICS ALGORITHMS (***)		3
*CHEM 2210: Requires CHEM 1140 & CHEM 1144 with grade of C- or better. Must take CHEM 2214 concurrently.			
**BIOL 2140: Requires BIOL 1450 and BIOL 1750, as well as CHEM 1140 or CHEM 1180. Must enroll in discussion.			
***BIOI 4860: Requires BIOI 3500 and CSCI 3320. BIOI 3500 can be taken concurrently. Prior completion of CSCI 4850 is strongly recommended but not required.			
		Credits	15
Spring			
BIOL 3020	MOLECULAR BIOLOGY OF THE CELL (*)		3
CHEM 3650 & CHEM 3654	FUNDAMENTALS OF BIOCHEMISTRY and FUNDAMENTALS OF BIOCHEMISTRY LABORATORY (**)		4
Elective (CSCI 4850 suggested)			3
BIOI 4870	DATABASE SEARCH AND PATTERN DISCOVERY IN BIOINFORMATICS		3
Social Science course			3

*BIOL 3020: Requires BIOL 2140 and CHEM 1140 or CHEM 1180.

**CHEM 3650: Requires CHEM 2210 & CHEM 2214 with grade of C- or better. Must enroll in CHEM 3654 concurrently.

***BIOI 4870: Requires BIOI 3500 and CSCI 3320. BIOI 3500 can be taken concurrently. Prior completion of CSCI 4850 is strongly recommended but not required.

		Credits	16
Senior			
Fall			
BIOL 4130 or BIOL 4140	MOLECULAR GENETICS (*) or CELLULAR BIOLOGY		4
PHYS 1050 & PHYS 1054	INTRODUCTION TO PHYSICS and INTRODUCTION TO PHYSICS LABORATORY (**)		5
OR ELECTIVE			
CIST 2500	INTRODUCTION TO APPLIED STATISTICS FOR IS&T (***)		3
Humanities/Fine Arts course#			3
*BIOL 4130 or 4140: Requires BIOL 2140, BIOL 3020, and CHEM 2210 & CHEM 2214 or CHEM 2260 & CHEM 2274.			
**PHYS 1050: Requires high school algebra.			
***#CIST 2500: Requires MATH 1220 or MATH 1300 or higher.			
		Credits	15
Spring			
BIOL 4560	BIOINFORMATICS INTERNSHIP (*)		3
CIST 3110	INFORMATION TECHNOLOGY ETHICS (**)		3
Social Sciences***			3
Elective (BIOL 4760 suggested)			3
Elective (BIOI 4890 suggested)			3
Elective if needed#			0-2
*BIOL 4560: Requires BIOL 2140, BIOI 3500, and permission of instructor.			
**CIST 3110: Counts as a Humanities/Fine Arts and required major course.			
**SS: Must be in a 2nd discipline.			
#Students must have a minimum of 120 credits to graduate with no less than 27 credits of 3000/4000 level coursework throughout the entire degree. Electives may be needed to reach these minimums.			
		Credits	15-17
		Total Credits	120-122

This roadmap is a suggested plan of study and does not replace meeting with an advisor. Please note that students may need to adjust the actual sequence of courses based on course availability. Please consult an advisor in your major program for further guidance.

This plan is not a contract and curriculum is subject to change

Additional Information About this Plan:

University Degree Requirements: The minimum number of hours for a UNO undergraduate degree is 120 credit hours. Please review the requirements for your specific program to determine all requirements for the program. In order to complete an undergraduate degree in four years, you need to take an average 30 credit hours each year.

Placement Exams: For Math, English, and Foreign Language, a placement exam may be required. More information on these exams can be found

at <https://www.unomaha.edu/enrollment-management/testing-center/placement-exams/information.php>

****Please note:** Transfer credit or placement exam scores may change suggested plan of study

GPA Requirements: 2.0